

Mc CURDY (S. LeR.)

INDEX
MEDICUS

THE MECHANICAL TREATMENT
OF SYNOVITIS.

BY

STEWART LEROY McCURDY, M. D.,
OF DENNISON, OHIO.

Surgeon to P., C. & St. L. Ry., Member of the National Association of Railway Surgeons, International Medical Congress (9th), American Medical Association, Etc.



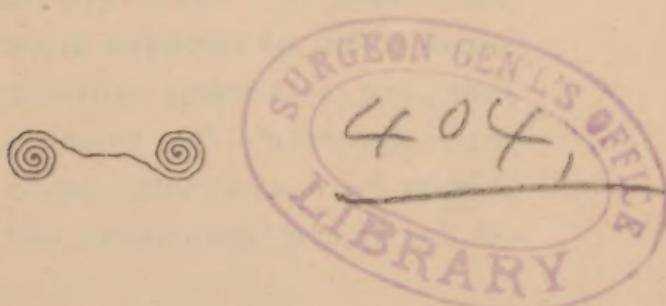
FROM
THE PITTSBURGH MEDICAL REVIEW
August, 1890.

THE MECHANICAL TREATMENT OF SYNOVITIS.

BY

STEWART LEROY McCURDY, M. D.,
OF DENNISON, OHIO.

Surgeon to P., C. & St. L. Ry., Member of the National Association of Railway Surgeons, International Medical Congress (9th), American Medical Association, Etc.



FROM
THE PITTSBURGH MEDICAL REVIEW,
August, 1890.

[Reprinted from THE PITTSBURGH MEDICAL REVIEW,
August, 1890.]



The Mechanical Treatment of Synovitis.

BY STEWART LEROY McCURDY, M. D., DENNISON, OHIO.
SURGEON TO P., C. & St. L. RY., MEMBER OF THE NATIONAL
ASSOCIATION OF RAILWAY SURGEONS, INTERNATIONAL MED-
ICAL CONGRESS (9TH), AMERICAN MEDICAL ASSOCIATION, ETC.

Previous to this it has been my pleasure to present the subject of yielding extension in the treatment of inflammatory diseases of joints upon three different occasions, and the invariable inquiry was: "If elastic extension was so much superior to other forms of treatment heretofore practiced, viz., that of rigid braces, plaster of Paris, etc., how does it control these affections, and why is it superior to the treatment practiced by others?"

To this I have but one answer, which is, in a manner, begging the question, viz., that if you do not believe in the treatment or disbelieve what I say, try it and be convinced.

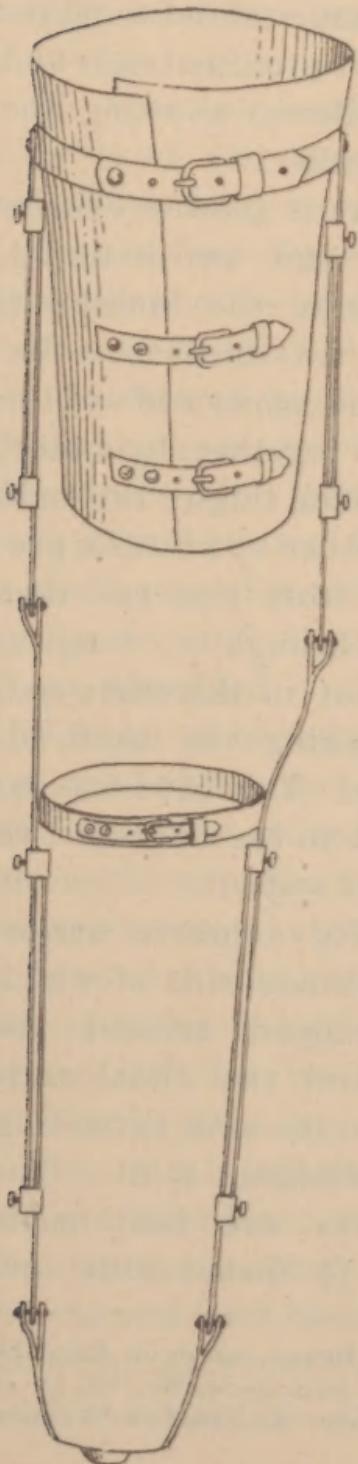
I have found it one thing to successfully treat acute and chronic inflammation of joints by the method about to be presented, and another to make plain and convincing arguments as to how this plan does control the joints so perfectly as to allow inflammation to subside and the products of the disease to disappear without limitation of motion or impairment of functional usefulness, when the usual results obtained are ankylosis, deformity, suppuration, secondary osteitis, exsiccation and even amputation.

I desire to make the sweeping statement that elastic extension, properly used in any case of synovitis of the human anatomy, will cure it, even in the stage of suppuration, with little ankylosis or deformity.

The only modification necessary to make to the foregoing is, that the diagnosis must be correct and the apparatus properly adjusted.

The essential elements of an extension apparatus are, a double system of malleable steel bars, arranged parallel and secured together at the proximal ends by a collar that slides over its fellow, and from which project buttons.

The distal ends are the fixed points and are secured to the affected member on either side of the diseased joint in such a way as to overreach it. By throwing an elastic



over the button projecting from the proximal ends, you can see the distal ends are thrown further from each other.

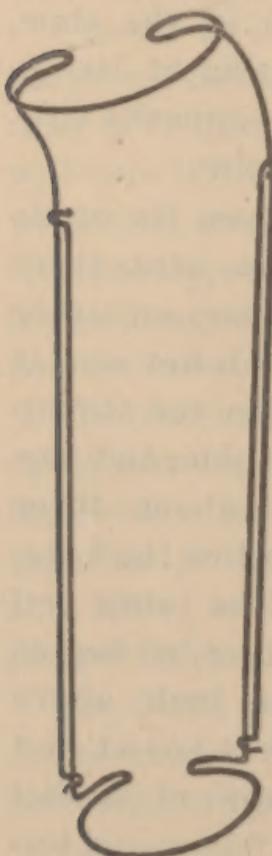
To make myself more plain, an apparatus used in the treatment of a knee joint synovitis consists:

1st. Of a stirrup screwed to the shoe, terminating at its upper ends opposite either malleolus

2d. From the ankle to the knee-joints there are two bars on either side, the lower one is jointed to the stirrup at the ankle, and terminates about three inches below the knee-joint. The lower end of the other bar begins about an inch above the ankle-joint and passes upward parallel with its fellow, and terminates opposite the

knee-joint. These bars are secured together by bands attached to their proximal ends and thrown around their fellows, allowing the bars to slide upon each other.

From the knee up there is another system of bars, two internal and two external, secured by joints opposite the knee-joint, and terminating about two-thirds the distance up the thigh. The upper ends of the upper bars are secured together by a steel band that passes around the thigh; the ends of this band are held together by a button projecting from one end that slides through a longitudinal slot in the other end, thus making the band adjustable. This band may be secured to the thigh in two different ways:



1st. By adhesive strips, the proximal ends of which are wrapped around the band and the distal ends stuck to the skin, extending to the diseased joint. The adhesives are best made about $1\frac{1}{2}$ inches wide, and

**Wrist Brace, used on Case II,
made of two pieces No. 10, 12 or
14 iron wire, at a cost of 25 cents.**

enough used to almost completely envelop the thigh.

2d. By a sole leather socket riveted to the steel band and buckled about the thigh sufficiently snug to allow the weight of the body to be borne by the inclination of the socket, similar to the socket of an artificial limb.

The brace is held parallel with the leg by an upholstered band riveted to the bars just below the knee, and buckled in front. From this description you will observe that we have obtained two fixed points: one below at the instep of the shoe and held to the foot by lacers, and the other at the thigh as above described.

Buttons or hooks project from the proximal ends of this system of parallel bars, and to these are secured the elastics, on the successful adjustment of which depends the entire success of elastic extension.

Synovitis is an inflammation of the synovial or lining membrane of the joint with a deposit of the products of inflammation within the joint-bag.

This local inflammatory disturbance results in local heat, swelling, infiltration into the structures about the joint, accumulation of synovial fluid, distention of the joint capsule with excruciating pain.

This distention and inflammation result

in a reflex nervous disturbance, putting all muscles which pass over the affected joint in a state of spasmodic contraction, which, as can be readily seen, increases the pressure of bone against bone, and in this way increases the injury to the inflamed synovial surfaces and thus in turn increases the muscular spasm and so on.

This condition of increased joint-pressure results in trophic changes, all the muscles that pass over, or whose tendons cross the affected joint undergo a perceptible atrophy in a few weeks after the onset of the disease. Circumferential measurement shows that the limb has shrunken an inch or more in a week or so.

The greater the degree of inflammation the more rapid the synovial accumulation, the greater the muscular tension and atrophy, and these symptoms all increase in succession, so that in a very short time our patient is confined to bed with pain almost unbearable, inability to move the affected member, loss of appetite, fever, emaciation, etc.

Buck's extension with liniments have not been at all satisfactory in handling these cases. Plaster of Paris and other rigid supports have been unsatisfactory, resulting in suppuration, confinement in bed for months, or even years, according to the prognosis

claimed by the best authorities, septicemia, pyemia, spontaneous dislocation, deformity, excision of joints, amputation, and death in a great many cases.

The intention of elastic extension is to put the joint at rest, not merely making it passive, but obtaining physiological rest. It would not be considered good judgment, and anything but scientific surgery, to sit upon a boil over the tuberosity of the ischium, or constantly aggravate an inflamed surface by rubbing it.

For the same reason we must not expect a severe synovitis to subside when the muscles in spasm are constantly tugging away and grinding the hyperemic and hyperesthetic synovial surfaces together with a force of many pounds. Unless the appliance, brace or whatever device may be used does secure rest to the inflamed surfaces, we can hardly expect a satisfactory result.

A diagnosis can generally be made without much difficulty, although synovitis may be confounded with articular rheumatism, osteitis, etc.

Manual extension is the most important diagnostic procedure, which is accomplished as follows: Grasp the affected member with both hands, one on either side of the diseased joint, and if the trouble be in the syno-

10. MECHANICAL TREATMENT OF SYNOVITIS.

vial membrane, by making firm but continuous traction, the muscular spasm will shortly yield, the joint pressure be removed in consequence, and the pain that is generally severe entirely disappear. This is of positive diagnostic value, and is only present in the trouble under consideration.

The claims that may be made for elastic extension may be tabulated as follows:

1. Intra-articular pressure should be removed, thus putting the inflamed surface at rest.

2. Reflex muscular spasms should be overcome and voluntary muscular power restored as much as possible.

3. The functional activity of joints should not be interfered with more than is absolutely necessary.

4. The movements of the diseased articulation should at all times be under the control of the surgeon.

5. The general nutrition of the patient and the local nutrition of the involved joint should be maintained at the highest possible standing, for the purpose of general growth and repair of the diseased tissues.

6. Sufficient linear support should be furnished the patient to counterbalance the loss of supporting power on the part of the affected member, thus permitting the patient to walk about.

7. Automatic or self-acting mechanisms should be utilized as far as possible.

8. The use of unyielding, rigid or cumbersome appliances should not be resorted to.

In reply to the inquiry as to how elastic extension extends, I want to say that the very moment that one of these braces is properly adjusted, pain disappears, general symptoms improve, appetite returns, temperature soon returns to normal, and in a very short time the patient begins to show substantial improvement.

In presenting this subject there has been some opposition by members of the profession, who claimed that it was impossible for any set of mechanical principles, no matter how combined, to overcome the dense ligamentous environments of the joints to such an extent as to admit of the least particle of separation; hence no benefit could be expected.

I want to claim here, that this brace will extend the joint sufficiently to remove intra-articular pressure, whether it does it by overcoming the ligamentous attachments or not.

Ankylosis, so frequently the result after synovitis, is always averted under this treatment, and this is obtained because the brace

does more than make the leg passive, as the plaster of Paris which favors the formation of adhesive bands across the joint and ankylosis; it puts the leg in a state of physiological rest, and at the same time does not interfere with the joint's normal functions, admits of free articular motion, consequently a recovery with a movable joint.

I feel that I should make an effort to explain the *modus operandi* of the treatment, and why the results *should* be different from those obtained by other plans of treatment now in vogue.

The greatest point of difference is that in one plan the joint is kept perfectly quiet for many weeks and even months, which as you can see will certainly give ample chance for ankylosis to occur, while in treatment by extension the joint is at all times under control of the patient.

ELASTIC EXTENSION.

1. Joint at all times under control of the patient, and freely movable, not allowing ankylosis.

2. Joint extended, overcoming muscular contraction.

RIGID SUPPORT.

1. Joint kept quiet, favoring ankylosis.

2. If joint is extended it is fixed until the splint is removed, or the surgeon calls and orders the ratchet to be used.

ELASTIC EXTENSION.

RIGID SUPPORT.

3. The amount of extension always equals the amount of muscular spasm, or contraction.

3. There is no other way to definitely measure and overcome the exact amount of muscular spasm and contraction.

In evidence of what has been claimed in the foregoing the following cases are appended :

Case I. John H., aged 22, was attacked with an acute synovitis of the right knee-joint, on June 1st. Every local and internal treatment used in an ordinary way in such cases was used by the attending physician, who I may say is well up in his profession, without having the least check to the onward progress of the case.

The case was seen June 21st, or three weeks after the onset of the trouble, and the joint capsule found greatly distended, pain, redness and swelling about the joint, elevation of the temperature, frequent pulse, loss of appetite, emaciation and atrophy of muscles of thigh and leg as was shown by circumferential measurement. The knee-joint was aspirated, from which about 6 ounces of synovia, mixed with pus cells and corpuscles and fibrine was removed.

Buck's extension was applied and sponges saturated with a liniment of glycerine, tincture aconite, tincture iodine and fluid extract belladonna were snugly bandaged about the joint, and the joint kept as quiet as possible. The case gave no history of traumatism, but he had had gonorrhœa, and a brother had died with tubercular phthisis.

July 27th the attendant wrote me that the joint was in "bad shape," which was true, for it had lost instead of gained during the month Buck's extension was on. At this date I took measurement for an extension apparatus which was applied early in August.

From the date of the application of the extension apparatus the knee began to improve, pain disappearing, appetite returning and the patient being able to sleep uninterrupted.

September 3d, patient was able to take a journey on railroad of 54 miles without any discomfort, and from that date on he visited me at my office, a distance of about 65 miles. At this time patient has made a complete recovery, and is able to walk any distance without crutches or brace.

Case II. Mr. L. H., locomotive fireman, struck side of fire-box door with shovel, and the concussion of palm of right hand against

the end of the shovel handle caused a synovitis of the wrist joint.

The joint was very much swollen, the swelling extending to knuckles and one-third the distance of the fore-arm. The pain was so severe as to be almost unbearable.

When I first saw him the diagnosis of the case was made clear by grasping the fingers of the affected member in one hand and the elbow in the other, and making gentle but firm extension, when shortly the pain entirely disappeared. An elastic extension apparatus was adjusted and the pain disappeared at once, symptoms began to disappear, general condition began to improve. Case was under treatment about two months, at the end of which time patient was able to return to light duty, and at the end of six months he was again on engine, firing with a hand which answered every demand made upon it.

